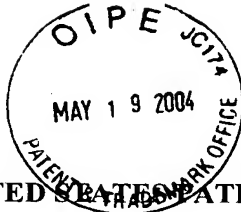


Docket No. 249420US2/hc



1FW

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

IN RE APPLICATION OF: Kazuo NAKAJIMA, et al.

SERIAL NO: 10/784,932

GAU:

FILED: February 25, 2004

EXAMINER:

FOR: MULTI-ELEMENT POLYCRYSTAL FOR SOLAR CELLS AND METHOD OF MANUFACTURING THE SAME

INFORMATION DISCLOSURE STATEMENT UNDER 37 CFR 1.97

COMMISSIONER FOR PATENTS
ALEXANDRIA, VIRGINIA 22313

SIR:

Applicant(s) wish to disclose the following information.

REFERENCES

- ☒ The applicant(s) wish to make of record the references listed on the attached form PTO-1449. Copies of the listed references are attached, where required, as are either statements of relevancy or any readily available English translations of pertinent portions of any non-English language references.
- ☐ A check or credit card payment form is attached in the amount required under 37 CFR §1.17(p).

RELATED CASES

- ☒ Attached is a list of applicant's pending application(s) or issued patent(s) which may be related to the present application. A copy of the patent(s), together with a copy of the claims and drawings of the pending application(s) is attached along with PTO 1449.
- ☐ A check or credit card payment form is attached in the amount required under 37 CFR §1.17(p).

CERTIFICATION


- ☐ Each item of information contained in this information disclosure statement was first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of this statement.
- ☐ No item of information contained in this information disclosure statement was cited in a communication from a foreign patent office in a counterpart foreign application or, to the knowledge of the undersigned, having made reasonable inquiry, was known to any individual designated in 37 CFR §1.56(c) more than three months prior to the filing of this statement.

DEPOSIT ACCOUNT

- ☒ Please charge any additional fees for the papers being filed herewith and for which no check or credit card payment is enclosed herewith, or credit any overpayment to deposit account number 15-0030. A duplicate copy of this sheet is enclosed.

Respectfully submitted,

OBLON, SPIVAK, McCLELLAND,
MAIER & NEUSTADT, P.C.


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Registration No. 24,913

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DOCKET NO.: 249420US2/hc



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STATEMENT OF RELEVANCY

Reference AN on Form PTO-1449:

This reference discloses an SiGe multocrystal locally having Ge-rich regions.

Reference AP on Form PTO-1449:

This reference includes 29a-ZV-3 which describes crystallographic orientation analysis of directional grown Si multocrystals.

Reference AQ on Form PTO-1449:

This reference includes 29a-ZV-5 which describes crystallographic orientation analysis and adsorption coefficient measurement of directional grown SiGe multocrystals with microscopic compositional distribution; and 29a-ZV-6 which describes elastic strain in ellipsoidal SiGe inclusion coherently embedded in Si matrix and its impact on the band structure.

Reference AR on Form PTO-1449:

This reference includes 26p-G-4 which describes effect of growth temperature on the morphology of epitaxial silicon film on Si (111) by LPE method.

Reference AS on Form PTO-1449:

This reference describes technique for SiGe multocrystal growth having microscopic compositional distribution and construction of Si/SiGe hetero structure.

Reference AT on Form PTO-1449:

This reference includes an abstract (414) which describes solidified texture and optical properties of Si-rich SiGe multocrystal.

Reference AU on Form PTO-1449:

This reference describes SiGe bulk multicrystal having microscopic compositional distribution and application to solar cell.

Reference AV on Form PTO-1449:

This reference discloses SiGe bulk multicrystal having microscopic compositional distribution and application to solar cell.

Reference AW on Form PTO-1449:

This reference includes S₈-17 which describes technique for controlling electronic band of semiconductor hetero structure by using strain and crystal growth.

Reference AX on Form PTO-1449:

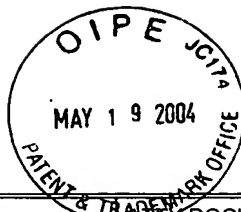
This reference includes 848 which describes solidified texture of SiGe multicrystal (compositional distribution of SiGe multicrystal) and optical properties.

Reference AY on Form PTO-1449:

This reference includes 12a-S-11 which describes control of macroscopic properties of microcrystalline SiGe by microscopic compositional distribution; and 26a-P11-3 which discloses crystallographic orientation analysis and absorption coefficient measurement of directional grown SiGe microcrystals with microscopic compositional distribution.

Reference AZ on Form PTO-1449:

This reference includes 30a-D-5 which discloses melt growth of multicrystalline SiGe with large compositional distribution for new solar cell applications.



SHEET 1 OF 2

Form PTO 1449 (Modified)		U.S. DEPARTMENT OF COMMERCE PATENT AND TRADEMARK OFFICE		PATENT DOCKET NO. 249420US2		SERIAL NO. 10/784,932	
LIST OF REFERENCES CITED BY APPLICANT				APPLICANT Kazuo NAKAJIMA, et al.			
				FILING DATE February 25, 2004		GROUP	
OTHER REFERENCES (Including Author, Title, Date, Pertinent Pages, etc.)							
	AA	N. USAMI, et al., Japan-Australia Workshop on Advanced Materials, Institute for Materials Research (IMR), pages xiv and 16, "ADVANCED SI-BASED MATERIALS FOR SOLAR CELL APPLICATIONS: MULTICRYSTALLINE-SiGe WITH MICROSCOPIC COMPOSITIONAL DISTRIBUTION AND VERTICALLY STACKED-Ge ISLANDS", January 15-19, 2004					
	AB	N. USAMI, et al., Journal of Applied Physics, vol. 94, no. 2, pages 916-920, "INFLUENCE OF THE ELASTIC STRAIN ON THE BAND STRUCTURE OF ELLIPSOIDAL SiGe COHERENTLY EMBEDDED IN THE Si MATRIX", July 15, 2003					
	AC	K. NAKAJIMA, et al., The Fourth International Edition of: Romanian Conference on Advanced Materials, 5 pages, "MELT GROWTH OF SiGe BULK CRYSTALS WITH UNIFORM COMPOSITION AND SiGe MULTICRYSTALS WITH MICROSCOPIC COMPOSITIONAL DISTRIBUTION FOR NEW Si/SiGe HETEROSTRUCTURAL SOLAR CELLS", September 15-18, 2003					
	AD	K. NAKAJIMA, et al., Abstract Book, 15 th American Conference on Crystal Growth and Epitaxy and 11 th Biennial Workshop on OMVPE and 3 rd International Symposium on Lasers and Nonlinear Optical Materials, pages 12, 45 and 46, July 2003					
	AE	K. FUJIWARA, et al., 3 rd World Conference on Photovoltaic Energy Conversion, 5 pages, "STRUCTURE AND PROPERTY OF DIRECTIONALLY GROWN SiGe MULTICRYSTALS WITH MICROSCOPIC COMPOSITIONAL DISTRIBUTION", May 11-18, 2003					
	AF	K. NAKAJIMA, et al., Solar Energy Materials & Solar Cells, vol. 73, pages 305-320, "GROWTH AND PROPERTIES OF SiGe MULTICRYSTALS WITH MICROSCOPIC COMPOSITIONAL DISTRIBUTION FOR HIGH-EFFICIENCY SOLAR CELLS", 2002					
	AG	N. USAMI, et al., Journal of Applied Physics, vol. 92, no. 12, pages 7098-7101, "STRAIN DISTRIBUTION OF Si THIN FILM GROWN ON MULTICRYSTALLINE-SiGe WITH MICROSCOPIC COMPOSITIONAL DISTRIBUTION", December 15, 2002					
	AH	N. USAMI, et al., Jpn. J. Appl. Phys., vol. 41, Part 1, no. 7A, pages 4462-4465, "EVIDENCE OF THE PRESENCE OF BUILT-IN STRAIN IN MULTICRYSTALLINE SiGe WITH LARGE COMPOSITIONAL DISTRIBUTION", July 2002					
	AI	N. USAMI, et al., Jpn. J. Appl. Phys., vol. 41, Part 2, no. 1A/B, pages L37-L39, "CONTROL OF MACROSCOPIC ABSORPTION COEFFICIENT OF MULTICRYSTALLINE SiGe BY MICROSCOPIC COMPOSITIONAL DISTRIBUTION", January 15, 2002					
	AJ	K. NAKAJIMA, et al., Abstract Book, International Forum on Science and Technology of Crystal Growth, 4 pages, "MELT GROWTH OF SiGe BULK CRYSTALS WITH UNIFORM COMPOSITION AND SiGe MULTICRYSTALS WITH MICROSCOPIC COMPOSITIONAL DISTRIBUTION FOR HETEROSTRUCTURE DEVICE APPLICATIONS", March 4-5, 2002					
	AK	K. NAKAJIMA, et al., Abstract Book, Thirteenth American Conference on Crystal Growth and Epitaxy, Session 1A, Pages iv, vii and 5, "GROWTH OF SiGe BULK CRYSTAL WITH COMPOSITIONAL UNIFORMITY OVER 20mm BY CONTROLLING THE GROWTH TEMPERATURE UTILIZING IN SITU MONITORING SYSTEM", August 12-16, 2001					
	AL	N. USAMI, et al., Extended Abstracts of the 20 th Electronic Materials Symposium, Nara, pages 185-186, "MULTICRYSTALLINE SiGe WITH MICROSCOPIC COMPOSITIONAL DISTRIBUTION FOR NEW SOLAR CELL APPLICATIONS", June 20-22, 2001					
	AM	K. NAKAJIMA, et al., The European Material Conference, European Materials Research Society, pages E-2, "MELT GROWTH OF MULTICRYSTALLINE SiGe WITH LARGE COMPOSITIONAL DISTRIBUTION FOR NEW SOLAR CELL APPLICATIONS", June 5-8, 2001					
	AN	K. NAKAJIMA, et al., pages 1-64, "REPORTS ON DEVELOPMENT OF Si/SiGe SOLAR CELL USING SiGe MULTICRYSTALLINE SUBSTRATE", March 2003 (with partial English translation)					
						<input checked="" type="checkbox"/> Additional References sheet(s) attached	
Examiner						Date Considered	
*Examiner: Initial if reference is considered, whether or not citation is in conformance with MPEP 609; Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.							



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LIST OF REFERENCES CITED BY APPLICANT				APPLICANT Kazuo NAKAJIMA, et al.			
				FILING DATE February 25, 2004		GROUP	
OTHER REFERENCES (Including Author, Title, Date, Pertinent Pages, etc.)							
	AO	K. NAKAJIMA, et al., pages 1-32, "REPORTS ON DEVELOPMENT OF Si/SiGe SOLAR CELLS USING SiGe MULTICRYSTALLINE SUBSTRATE ", March 2002 (with partial English translation)					
	AP	K. FUJIWARA, et al., Extended Abstracts (The 50 th Spring Meeting), The Japan Society of Applied Physics and Related Societies, no. 1, page 457, "29a-ZV-3 CRYSTALLOGRAPHIC ORIENTATION ANALYSIS OF DIRECTIONAL GROWN Si MULTICRYSTALS", March 2003					
	AQ	K. FUJIWARA, et al., Extended Abstracts (The 50 th Spring Meeting), The Japan Society of Applied Physics and Related Societies, no. 1, page 458, "29a-ZV-5 CRYSTALLOGRAPHIC ORIENTATION ANALYSIS AND ABSORPTION COEFFICIENT MEASUREMENT OF DIRECTIONAL GROWN SiGe MULTICRYSTALS WITH MICROSCOPIC COMPOSITIONAL DISTRIBUTION" March 2003 and "29a-ZV-6 ELASTIC STRAIN IN ELLIPSOIDAL SiGe INCLUSION COHERENTLY EMBEDDED IN Si MATRIX AND ITS IMPACT ON THE BAND STRUCTURE", March 2003					
	AR	T. UJIHARA, et al., Extended Abstracts (The 63 th Autumn Meeting) The Japan Society of Applied Physics, no. 2, page 783, "26p-G-4 EFFECT OF GROWTH TEMPERATURE ON THE MORPHOLOGY OF EPITAXIAL SILICON FILM ON Si(111) BY LPE METHOD", September 2002					
	AS	K. NAKAJIMA, et al., page 57, Abstract of Lecture Meeting, The Japan Society of Metal, "S ₁ . 22", March 28-30, 2002					
	AT	K. NAKAJIMA, et al., pages 284, Abstract of Lecture Meeting, The Japan Society of Metal, "ABSTRACT 414", March 28, 2002					
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	AV	K. NAKAJIMA, et al., pages 104-107, Workshop on High Efficiency Solar Cell and Photovoltaic Generation", November 15, 2001					
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	AX	K. NAKAJIMA, et al., page 476, Abstract of Lecture Meeting of the Japanese Society of Metal, "ABSTRACT 848", September 22-24, 2001					
	AY	N. USAMI, et al., Extended Abstracts (The 62 th Autumn Meeting), The Japan Society of Applied Physics, no. 1, Pages 302, 368 and 458, "12a - S - 11 CONTROL OF MACROSCOPIC PROPERTIES OF MULTICRYSTALLINE-SiGe BY MICROSCOPIC COMPOSITIONAL DISTRIBUTION" and "26a-P11-3 CHARACTERIZATION OF MULTICRYSTALLINE SiGe WITH MICROSCOPIC COMPOSITIONAL DISTRIBUTION USING μ -RAMAN SPECTROSCOPY", September 11, 2001					
	AZ	K. NAKAJIMA, et al., Extended Abstracts (The 48 th Spring Meeting), The Japan Society of Applied Physics and Related Societies, no. 1, pages 452, "MELT GROWHT OF MULTICRYSTALLINE SiGe WITH LARGE COMPOSITIONAL DISTRIBUTION FOR NEW SOLAR CELL APPLICATIONS", March 28-31, 2001					
	BA	N. NAKAJIMA, et al., Crystal Letters, no. 18, pages 3-14, December 2001 (with English Abstract)					
	BB						
						<input type="checkbox"/> Additional References sheet(s) attached	
Examiner						Date Considered	
*Examiner: Initial if reference is considered, whether or not citation is in conformance with MPEP 609; Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.							



LIST OF RELATED CASES

<u>Docket Number</u>	<u>Serial or Patent Number</u>	<u>Filing or Issue Date</u>	<u>Inventor/ Applicant</u>
220960US0	10/105,391	03/26/02	NAKAJIMA et al.
249420US2*	10/784,932	02/25/04	NAKAJIMA et al.

*Present Application; listed for information

GJM/sb

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